

Claims

What is claimed is:

1. A storage device with optimal compression management
5 mechanism, comprising a controller and at least a
solid-state storage medium; said controller has an internal
system interface that may be connected to an external system
end, a microprocessor that processes system instructions,
and a memory interface that communicates with said
10 solid-state storage medium; wherein said storage device is
featured with:
a data compression/decompression module is devised between
said system interface and said memory interface; said data
compression/decompression module is wired to said
15 microprocessor and has a data compression circuit and a
plurality of algorithm definitions and parameter lists that
are used with said data compression circuit;
said microprocessor distinguish the type of the raw data
transferred from the system interface and choose the most
20 suitable compression combination from said algorithm
definitions and parameters; said data compression circuit
compresses the raw data into minimized data volume
according said compression combination and stores the
compressed data into said solid-state storage medium.
- 25 2. The storage device with optimal compression management
mechanism as in claim 1, wherein said solid-state storage
medium stores indexes referring to the optimal algorithm
definition and parameter list.
3. The storage device with optimal compression management
30 mechanism as in claim 2, wherein said data

compression/decompression module further has a data
decompression circuit, which is triggered by the
microprocessor to read said indexes from the solid-state
storage medium and decompress the compressed data into raw
5 data according to the algorithm definition and parameter
list referred by the indexes.

4. The storage device with optimal compression management
mechanism as in claim 1, wherein said storage device has
the first data cache wired to said system interface, said
10 microprocessor, and said data compression/decompression
module.

5. The storage device with optimal compression management
mechanism as in claim 1, wherein said microprocessor has
the second data cache wired to said memory interface, said
15 microprocessor, and said data compression/decompression
module.

6. The storage device with optimal compression management
mechanism as in claim 1, wherein said data
compression/decompression module is devised in said
20 controller.

7. The storage device with optimal compression management
mechanism as in claim 1, wherein said microprocessor
distinguishes the type of the raw data on the basis of the
distribution of binary bits in the raw data.

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